

The invention claimed is:

1. A method of fabricating an energy storage device, comprising:  
providing a substrate;  
forming an electrode first film;  
forming an electrolyte second film, wherein forming the electrolyte second film includes:  
depositing electrolyte material using a deposition source; and  
supplying energized particles from a second source such that the particles provide energy to the electrolyte material to deposit the electrolyte material into a desired film structure; and  
forming an electrode third film.
2. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy of greater than about 5 eV.
3. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy of less than about 3000 eV.
4. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy in the range of about 5 eV to about 500 eV.
5. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy in the range of about 5 eV to about 250 eV.
6. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy in the range of about 10 eV to about 200 eV.
7. The method of claim 1, wherein supplying energized particles includes supplying ions having an energy in the range of about 0 eV to about 40 eV.
8. The method of claim 1, wherein forming the electrolyte second film

includes forming the electrolyte film to a thickness of less than about 5000 Angstroms.

9. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness of less than about 2500 Angstroms.

10. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness of less than about 1000 Angstroms.

11. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness of less than about 500 Angstroms.

12. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness of less than about 250 Angstroms.

13. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness of less than about 100 Angstroms.

14. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness in a range of about 10 Angstroms to about 200 Angstroms.

15. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness in a range of about 10 Angstroms to about 100 Angstroms.

16. The method of claim 1, wherein depositing electrolyte material includes depositing  $\text{Li}_3\text{PO}_4$  electrolyte material.

17. The method of claim 1, wherein supplying energized particles includes supplying energized nitrogen particles, and reacting the nitrogen particles with the  $\text{Li}_3\text{PO}_4$  electrolyte material.

18. The method of claim 1, wherein forming the electrolyte second film includes providing a nitrogen-enriched atmosphere in which the  $\text{Li}_3\text{PO}_4$  electrolyte material is deposited.

19. The method of claim 1, wherein forming the electrolyte film includes forming the electrolyte film to a thickness sufficient to insulate the electrode first film from the electrode second film and to allow ion transport between the electrode first film and the electrode second film.

20. The method of claim 19, wherein forming the electrode first film includes depositing at least one of a metal and an intercalation material.

21. The method of claim 20, wherein forming the electrode third film includes depositing at least one of a metal and an intercalation material.

22. The method of claim 1, wherein forming the electrolyte second film includes forming the electrolyte film to a thickness in a range of about 1 nanometer to about 250 nanometers.

23. The method of any of claims 1 through 22, wherein the electrolyte second film is lithium phosphorus oxynitride.

24. The method of any of claims 1 through 22, wherein the electrolyte second film is a silicon dioxide.

25. The method of any of claims 1 through 22, wherein the electrolyte second film is an aluminum oxide.

26. A solid-state energy-storage device, comprising:  
an electrode first film;  
an electrolyte second film;  
an electrode third film; and  
ions having an energy of greater than about 5 eV.

27. The device of claim 26, wherein the electrolyte second film has a thickness of less than about 2500 Angstroms.

28. The device of claim 26, wherein the electrolyte second film has a thickness of less than about 1000 Angstroms.

29. The device of claim 26, wherein the electrolyte second film has a thickness of less than about 500 Angstroms.

30. The device of claim 26, wherein the electrolyte second film has a thickness of less than about 250 Angstroms.

31. The device of claim 26, wherein the electrolyte second film has a thickness of less than about 100 Angstroms.

32. The device of claim 26, wherein the electrolyte second film has a thickness in a range of about 10 Angstroms to about 200 Angstroms.

33. The device of claim 26, wherein the electrolyte second film has a thickness in a range of about 10 Angstroms to about 100 Angstroms.

34. The device of claim 26, wherein the electrolyte first film includes a lithium intercalation material.

35. The device according to claim 34, wherein the third film includes one or more of a metal, a carbon material, and an intercalation material.

36. The device according to claim 26, wherein the first film includes a vanadium oxide, the second film includes lithium phosphorus oxynitride, and the third film includes a lithium intercalation material.